

REVA University Campus Tour using Virtual Reality

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Abstract—Stepping into the magical world of Virtual Reality gifts an experience unlike any other. All around us all things are bright and beautiful. By this state-of-the-art work, we aim to give our users/stakeholders/visitors the experience of visiting the REVA University campus virtually, from any place at any desired time. We would be able to achieve this by a Head Mounted Display (HMD), here we used the VR Box. Once the user wears the VR Box, on it will be mounted a display which is the key tool in transporting the user virtually to the campus. It will make you feel like you are there mentally and physically. When you turn your head, you can able to see the 360-degree world turns with you, so the illusion created by whatever world you are in is never lost. There are several types of virtual reality from fully-immersive and non-immersive to collaborative and web-based. Here, we have used the fully-immersive variation because this is the explorable and interactive 3D computer-created world that can take you around the campus. The user will be able to experience Virtual Reality tour with a full satisfaction of having visited the REVA University without having to physically walk around the entire campus.

Keywords—REVA University, Virtual Reality, Unity, VR Headset

I. INTRODUCTION

A. Background Study

It is a dream to belong to a university which has a huge campus like REVA University. Photographs, Floor plans and 360-degree view present in our university website tells us only a part of the story but imagine allowing the visitors to curiously explore our entire university without having to walk around our huge campus.

Sounds incredible right?

So, keeping this as a head-start for our state-of-the-art work, we used the technology called Virtual Reality (VR) to implement our idea.

II. LITERATURE SURVEY

Virtual Reality Tours Can Help Every Student Pick the Right University [3] – Students need to be open to the opportunity’s VR provides to allow them to experience a university without traveling there. Whether they are narrowing down their options to the universities they will visit in person, or substituting VR tours for in-person visits, they will need to prepare for the experience, just as they would prefer for an actual visit to the university.

Virtual Reality could be the Next Fro in University Campus Tours [4] – VR and three-dimension technologies are shaping industries that stand to benefit from immersive and interactive custom-built environments. In provision of

the technology’s incredible abilities, a University in United States has recently used a new VR-enabled virtual tour powered by location-based software company concept3D Inc.

YouVisit [2] offers the only platform that can weave multiple media types into one single asst, transforming traditional photos and videos into immersive and interactive content using Virtual Reality, while additionally capturing interest, intent and inquiries.

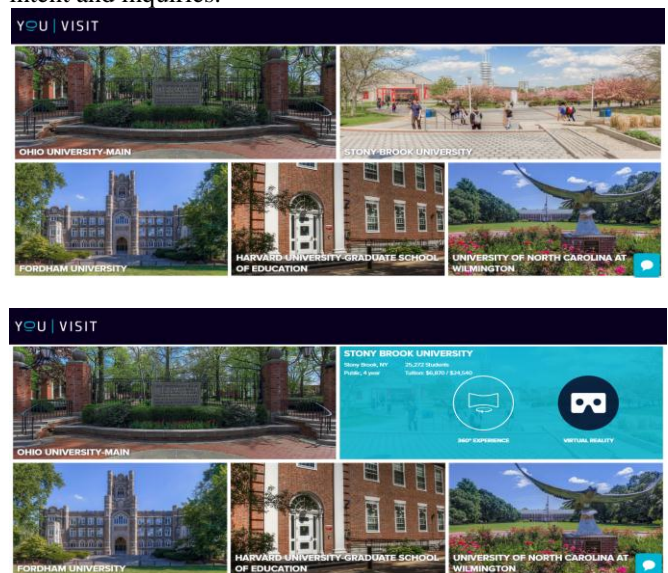




Figure 1. YouVisit – Virtual Reality Campus Tours (Example Shown: Stony Brook University)

R. F. Rahmat, et.al [1] the paper titled as “Virtual reality interactive media for universitas sumatera utara – a campus introduction and simulation” aims to study and implement virtual reality as a new approach to distribute the information to cover all the deficiencies. The practice of virtual reality technology combined with 3D modelling is aims to introduce and inform the location of USU institutional buildings in interactive and innovative ways.

III. STATE-OF-THE-ART PROPOSED SYSTEM

This paper outlines the implementation of the VR campus tour. We have used the platform called Unity. The stable Unity version 2018.4.20f2 has been used. In order to make the reality virtual, we need the VR headset to mount the android smartphone. Once the android smartphone having with APK file is mounted on the VR headset, the magic begins.

For the virtual environment, foremost task is to capture the virtual world. Specific to our state-of-the-art proposed system that focuses on the REVA University campus, the 360-degree pictures of the campus are taken. Using these pictures, the virtual environment is created using Unity. This tool majorly uses C# for its scripting, apart from this there is also JavaScript and Boo. With the help of scripting, the virtual world becomes responsive.

Once the virtual world is ready, this Unity work must be exported and are integrated to form a single application as an APK file for the android smartphone. Then this android smartphone is mounted on the VR Box. When the user/stakeholder/visitor wears the VR Box, can able to experience Virtual Reality tour with a full satisfaction of having visited the REVA University without having to physically walk around the entire campus.

IV. SYSTEM DESIGN

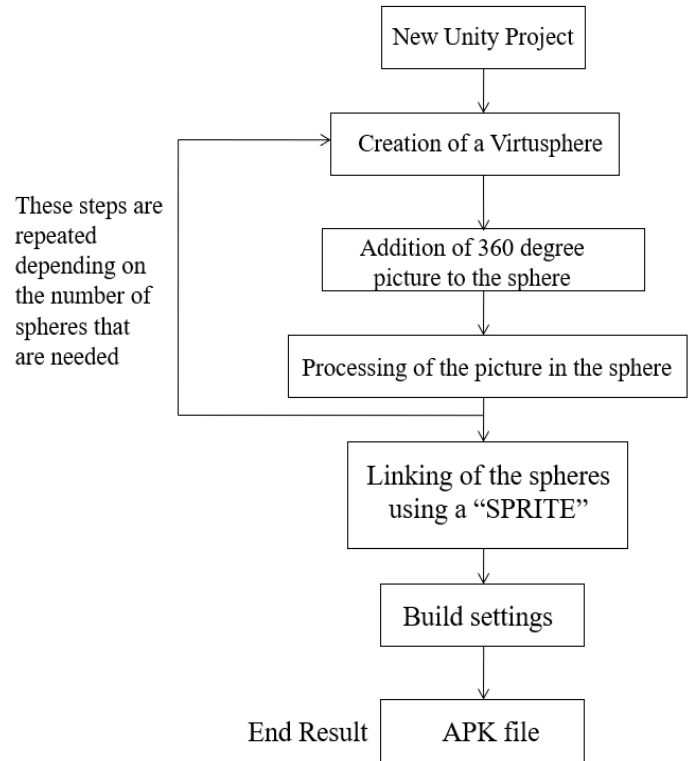


Figure 2. Data Flow Diagram of Working in Unity
Figure 3.

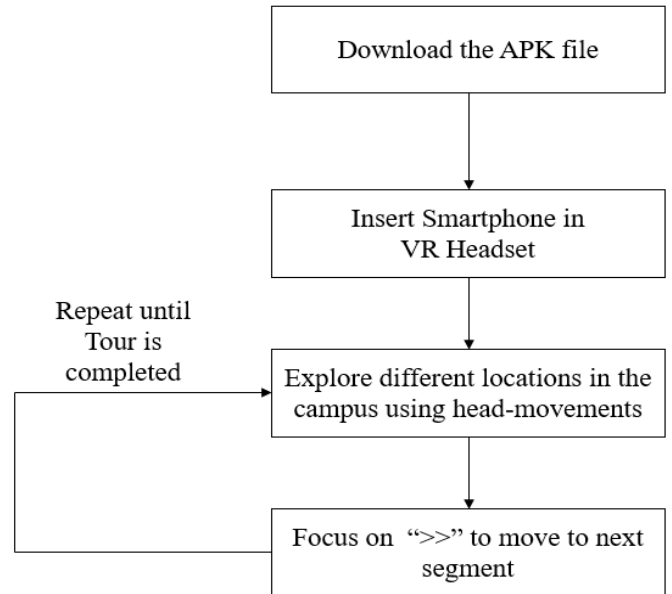


Figure 4. Data Flow Diagram of User/Visitor exploring the REVA University Campus Tour using Virtual Reality

V. METHODOLOGY

This state-of-the-art work is mainly developed in two phases.

First Phase: Working on Unity platform to create an APK file.

- **Creating a Virtuesphere**

On choosing a New Unity Project to create the virtual environment, the next step is to create multiple 3D objects which in our case is a 'sphere'.

- **Adding 360-Degree Images**

These empty spheres are made to bear the 360-degree images by simply dragging and dropping it into them.

- **Linking the Spheres**

All the spheres containing the 360-degree images are linked to one another for a continuity in viewing the tour. These spheres are linked using a 'sprite' which allows us to smooth transition from one sphere to the next achieving the continuity.

- **Creating an APK File**

After linking the spheres, the next step is to create an APK file of the created project. On building the project, an APK file of the same is created which can be saved and downloaded on the user's Smartphone.

Second Phase: Downloading of APK file in Android Smartphone, then inserting the Smartphone in VR Headset and starting with the REVA University Campus Tour using Virtual Reality.

- **Downloading the APK File**

The APK file created can now be downloaded and installed in the user's Smartphone. This APK file once installed will appear as an application on the Smartphone.

- **Using VR Headset to view the Virtual Reality Tour**

Finally, the user can now make use of a VR headset to view the virtual reality tour of our REVA University campus. This is simply done by mounting the Smartphone containing the application onto the headset and wearing it.

- **User/Visitor Interaction**

The user/visitor wearing the VR headset can simply experience the virtual reality tour by moving his/her body around to get a full 360-degree view of the location. To move forward, the user/visitor should simply focus on the 'sprite' which is in the form of a directed arrow.

VI. SYSTEM REQUIREMENTS

A. Unity

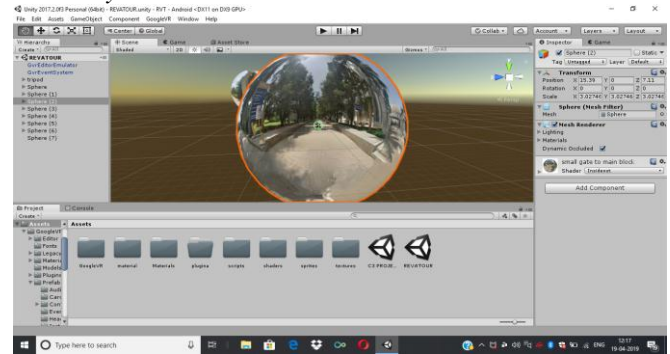


Figure 5. Unity Tool

Unity is the most widely used VR development platform, and over 91% of HoloLens experiences are Made with Unity. Whether it's Virtual Reality, Augmented Reality, or Mixed Reality, you can count on Unity's highly optimized rendering pipeline and the rapid iteration capabilities to make your XR creative vision a reality. [5]

B. VR Headset



Figure 6. VR Box

VR Box headsets will bring you to an immersive, tremendous virtual world while you playing games, watching 3D videos, with this headset you will find the VR world is amazing. This VR Box come with two adjustable lens, allowing you to adjust the focus through moving the button on the top of the VR LENSES. When you want to enjoy the 3D virtual reality, this durable and adjustable T-shaped straps make it possible to fit different group of people, from young children to aged people. Also, the soft padding in front of the VR cardboard also make it comfortable to wear. Anti-dust design that is made available in the front cover with slid feature can stop dust going into the cardboard of headset. Suppose if there is any muddiness, you can slid and open the cover to clean it, the cover also help you keep the light out, so you can have a better experience of virtual world compatible with Android Smartphones and iPhones.

VII. EXPERIMENTAL RESULTS

A. Working in Unity Tool

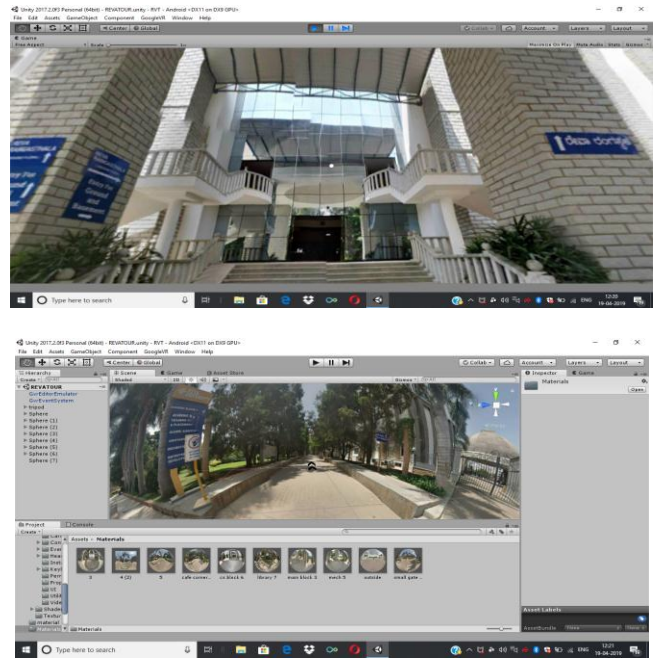
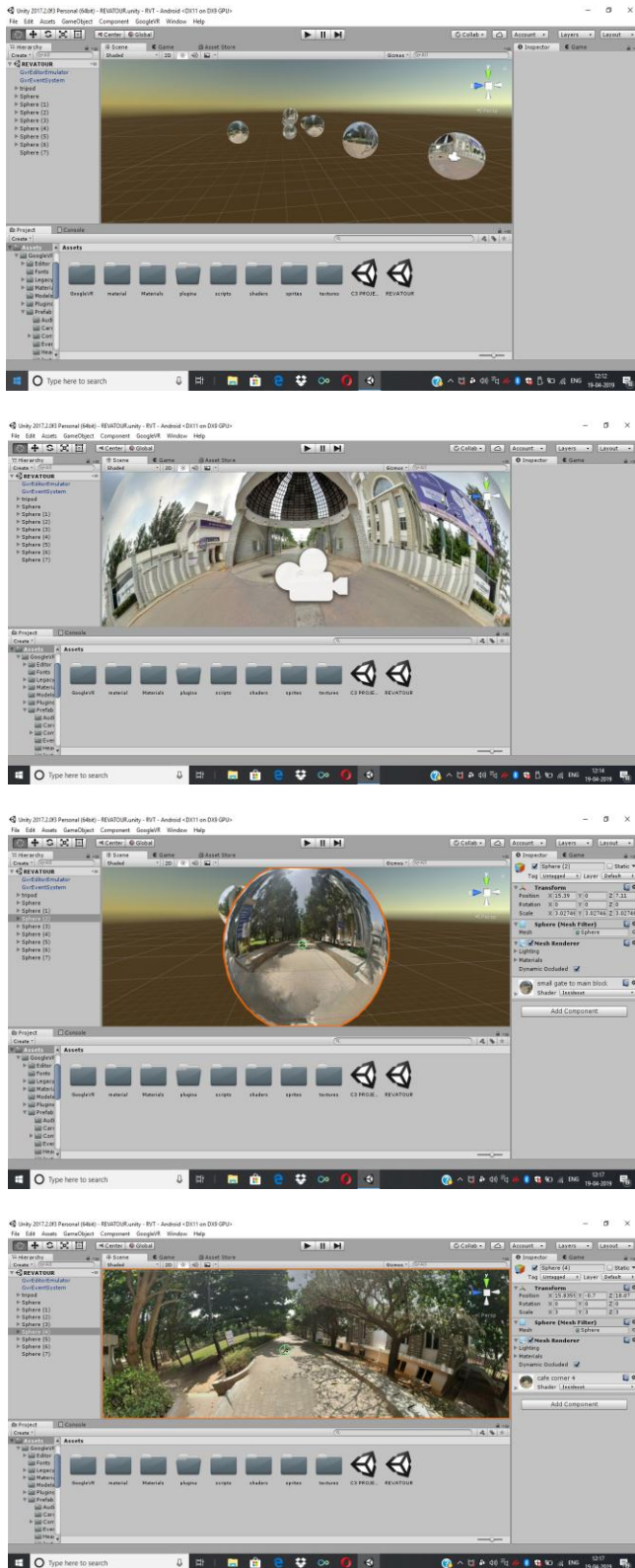
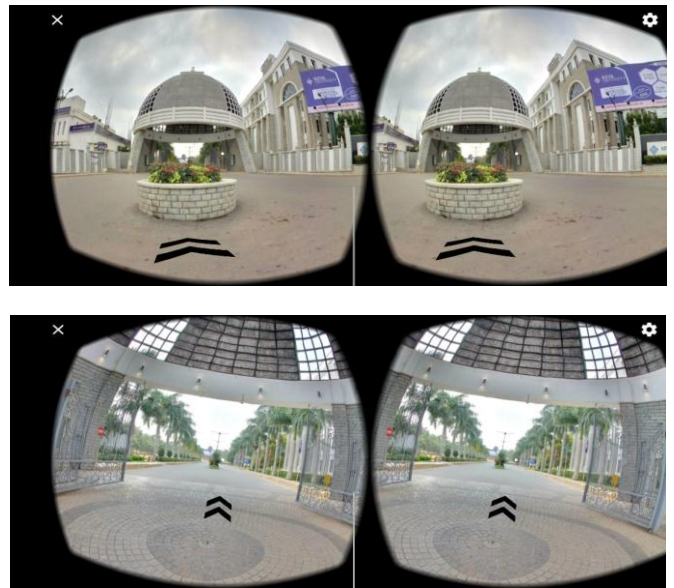


Figure 7. Working in Unity Tool

B. Virtual Reality Experience of REVA University Campus Tour on Android Smartphone



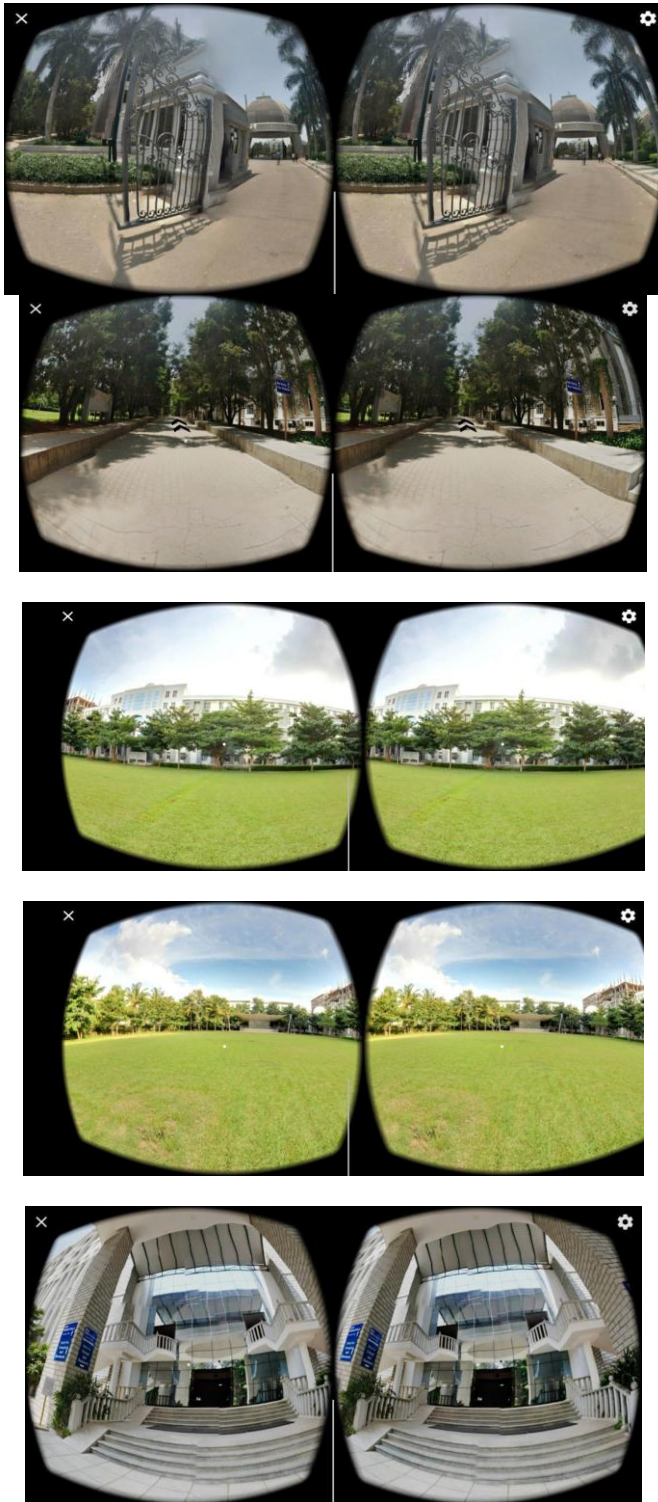


Figure 8. REVA University Campus Tour using Virtual Reality

VIII. CONCLUSION AND FUTURE ENHANCEMENT

Virtual Reality is not only a milestone to the growing technology but also, is an aspect that contributes in providing a great deal of excitement to the users and scores an extra mark for its solitary attribute. Thus, this technology helped us to create as well as experience the Virtual Reality tour with a full satisfaction of having visited the REVA University without having to physically walk around the entire campus. The future implementation and extension of this state-of-the-art model can further be enhanced by adding other features such as voiceovers. In addition to this, we can also use hardware components for movements and hand-gestures.

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